in EU5, a subject about which nothing has been published to date. **METHODS:** A burden of illness model was constructed to examine the impact of RHT in EU5, specifically the incremental incidence, mortality and direct medical costs of CVD, which includes: coronary heart disease (CHD), congestive heart failure (CHF) and stroke. Framingham risk equations which included a coefficient for treatment resistance and SCORE risk charts were used to estimate the risk of CVD for patients with and without RHT. Transition probability data were taken from the literature to estimate the risk of death from CVD events, subsequent CVD events and ESRD. Direct costs for these events and their long-term consequences were taken from the literature and from country-specific drug and acute inpatient costs. **RESULTS:** The total direct medical cost of RHT in EU5 is estimated to be €3.9 billion in 2013. This does not include the cost for drugs to treat RHT, or other costs such as lost productivity not directly borne by the health care system. RHT will contribute to 188,000 cases of CHD, 57,400 strokes, 31,500 CHF and 1,400 ESRD and 30,000 deaths in 2013. **CONCLUSIONS:** The burden of RHT due to the increased incidence of CVD and ESRD is high. Reducing the incidence of CVD and ESRD through better blood pressure control should be a priority for health care decision makers.

PCV54

RETROSPECTIVE COSTING STUDY TO ESTIMATE BURDEN OF HEART FAILURE IN SPAIN

Llorens P[1], Crespo C[2], Pérez-Alcántara F[2]
[1]*Hospital General Universitario, Alicante, Spain,* [2]*Oblikue Consulting, Barcelona, Spain*

OBJECTIVES: To analyze and estimate resource utilization and associated costs, one year following an acute episode of heart failure (HF) in Spain. **METHODS:** Patient-flow data after index hospitalization for acute HF (AHF) were obtained from EAHFE database, an emergency (ER)-based registry containing records of all AHF patients treated in 29 Spanish hospitals (over 5,800 cases). Estimated medical resource utilization data during patients' ER and other wards stay, hospitalization, and first-year follow-up was collected from medical specialists through questionnaire. AHF episodes and hospitalizations incident rates were estimated through literature review and disease statistics in official sources. Cost data was retrieved from Spanish Pharmacists official sources and a national health care costs database (Euros, 2013). To assess uncertainty, sensitivity analysis was carried out. **RESULTS:** A total of 111,803 annual hospital admissions are estimated in Spain (2013). 92% of patients suffering an AHF episode are discharged alive and of these 90% survive the first month; 23% of these patients are discharged directly from ER, while the majority of those who are hospitalized, are admitted to Internal Medicine (53%) or Cardiology (17%) wards. On an average, patients are re-admitted 0.41 times within 1 year. Total direct costs in the first year following an AHF episode averages €6,822, of which 88% are incurred in hospital, with drugs and diagnostic tests accounting for less than 5% of all hospital costs. Follow-up costs, in average, split equally between drugs and outpatient visits/tests, but vary widely depending on local HF protocols. Extrapolation of results to the Spanish population suggests that the total burden of HF is more than €542 million per year. **CONCLUSIONS:** Treating HF patients within Spain is resource intensive. Costs are primarily incurred in hospital and are mostly driven by the length of stay.

PCV55

THE BURDEN OF ILLNESS OF CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION: A MANAGED CARE PERSPECTIVE IN THE UNITED STATES

Joish VN[1], Muccino D[1], Kreilick C[2], Kamalakar R[2], Yao J[2], Mathai S[3]
[1]*Bayer HealthCare Pharmaceuticals, Inc., Wayne, NJ, USA,* [2]*Bayer HealthCare, Wayne, NJ, USA,* [3]*Johns Hopkins University School of Medicine, Baltimore, MD, USA*

OBJECTIVES: Chronic thromboembolic hypertension (CTEPH) is associated with considerable morbidity and mortality. The objective of this study was to describe the burden of illness in patients with CTEPH. **METHODS:** Data for this study came from a large commercial claims database. CTEPH patients were identified based on having >2 medical claims for either primary pulmonary hypertension (ICD-9 code:416.0) or chronic pulmonary heart disease (ICD-9 code:416.8), history of pulmonary embolism in the past one year (ICD-9 code:415.1, V12.51, 38.7; CPT-4 codes:36010, 37620, 75825, 75940; HCPCS codes:C1880) and either one claim for right heart catheterization or one claim of echocardiogram and diagnosed by a pulmonologist/cardiologist within 12 months of the medical claim. Demographic variables were extracted at a patient level from administrative files and economic variables, which included health care utilization and costs for outpatient, inpatient, emergency and pharmacy services came from the respective medical and pharmacy claim files and summarized at a per-patient-per-month (PPPM). Five controls were randomly picked and matched to each CTEPH patient on demographic characteristics. Incremental burden of CTEPH was estimated using non-parametric statistical tests between controls and CTEPH group. All costs were adjusted to 2012 base year using consumer price index. **RESULTS:** A total of 191 CTEPH patients were identified and matched to 955 controls. CTEPH group had significantly higher ($p<0.001$) PPPM health care utilization compared to the matched control across all drivers: outpatient (3.1 vs. 1.5), inpatient (0.13 vs. 0.02), emergency room (0.16 vs. 0.04), and pharmacy services (4.5 vs. 2.6). The increase in utilization translated in higher ($p<0.001$) total PPPM incremental costs of $5,007 in the CTEPH group with inpatient ($3,909 vs. $332) and pharmacy costs ($607 vs. $180) being as much as twelve and three times greater compared to controls. **CONCLUSIONS:** Health care resource use and costs for CTEPH patients is high from a managed care perspective.

PCV56

THE BURDEN OF ILLNESS OF PULMONARY ARTERIAL HYPERTENSION: A MANAGED CARE PERSPECTIVE IN THE UNITED STATES

Joish VN[1], Muccino D[1], Kreilick C[2], Kamalakar R[2], Yao J[2], Mathai S[3]
[1]*Bayer HealthCare Pharmaceuticals, Inc., Wayne, NJ, USA,* [2]*Bayer HealthCare, Wayne, NJ, USA,* [3]*Johns Hopkins University School of Medicine, Baltimore, MD, USA*

OBJECTIVES: Pulmonary arterial hypertension (PAH) is a progressive disease resulting in high health care resource use and costs. The objective of this study was to estimate the burden of illness in PAH patients. **METHODS:** Data came from a large commercial claims database. PAH patients were identified based on having >2 medical claims for primary pulmonary hypertension (ICD-9 code:416.0), and either one claim for right heart catheterization or one claim of echocardiogram and diagnosed by a pulmonologist/cardiologist within 12 months of the medical claim. The first medical claim during this period served as in the index date with 12 months prior to this event as baseline and 12 months post as follow-up period. Demographic variables were extracted at a patient level from administrative files and economic variables, which included health care utilization and costs for outpatient, inpatient, emergency and pharmacy services came from the respective medical and pharmacy claim files and summarized at a per-patient-per-month (PPPM). Five controls were randomly picked and matched to each PAH patient on demographic characteristics. Incremental burden of PAH was estimated using non-parametric statistical tests between controls and PAH group. All costs were adjusted to 2012 base year using consumer price index. **RESULTS:** A total of 2,245 PAH patients were identified and matched to 11,225 controls. PAH group had significantly higher ($p<0.001$) PPPM health care utilization compared to the matched control across all drivers: outpatient (2.6 vs. 1.5), inpatient (0.08 vs. 0.02), emergency room (0.1 vs. 0.04), and pharmacy services (4.2 vs. 2.6). The increase in utilization translated in higher ($p<0.001$) total PPPM incremental costs of $3,193 in the PAH group with inpatient ($1,665 vs. $345) and pharmacy costs ($790 vs. $178) being as much as five times greater compared to controls. **CONCLUSIONS:** Health care resource use and costs for PAH patients is high from a managed care perspective.

PCV57

COSTS OF ACUTE HEART FAILURE IN FRANCE

Bouee S[1], Laurendeau C[2], Detournay B[1], Kind B[3], Deschaseaux C[4], Ong SH[4], Lecomte P[4]
[1]*Cemka, Bourg la Reine, France,* [2]*Cemka-Eval, Bourg la Reine, France,* [3]*Novartis, Rueil-Malmaison, France,* [4]*Novartis Pharma AG, Basel, Switzerland*

OBJECTIVES: To describe the incidence and profile of patients hospitalised for acute heart failure (AHF); to assess the trajectories of patients before and after hospitalization; and to estimate the cost of AHF inpatients stays. **METHODS:** Patients with AHF were identified over a 5-year period (2006 - 2010) from the French PMSI (Programme de Médicalisation des Systèmes d'Information), a national disease-related group inpatient database. The PMSI database contains data related to all private and public hospital stays in France (about 20 millions/year). Heart failure was identified with the ICD-10, code I50. **RESULTS:** The numbers of patients hospitalised at least once per year for AHF increased from 144,043 in 2006 to 158,623 in 2010. These numbers lead to incidence rates of 2.28‰ in 2006 and 2.45‰ in 2010. The proportion of patients aged ≥75 increased from 71.0% in 2006 to 74.3% in 2010. Half of patients were male. The mean number of comorbidities was 9.6 in 2010. The mean length of stay was 9.5 days and 12.6 days per year (2010), as mean re-hospitalization for AHF within the same year was 22%. The mean annual number of AHF hospitalisations per patient was 1.3. The mean cost for an AHF hospitalisation in the acute setting was 4,713€ in 2010. The mean annual cost for all hospitalisations occurring for a patient hospitalised at least once in a year (2010) for AHF was 6,253€. Mean costs per hospital stay was higher if the patient died during hospitalisation (5,722€ vs. 4,627€, $p<0.001$). Extrapolation to the whole country leads to a yearly cost of nearly a billion of euros (991 millions). **CONCLUSIONS:** Incidence of AHF hospitalisation increased in the recent years. This analysis highlighted the high economic hospital burden of AHF in France.

PCV58

DISEASE BURDEN OF ISCHEMIC STROKE ALONG FIRST YEAR POST-STROKE IN SPAIN

Álvarez Sabín J[1], Masjuan J[2], Yébenes M[3], Mar J[4], Oliva J[5], González-Rojas N[6]
[1]*Hospital Vall D'Hebrón, Barcelona, Spain,* [2]*Hospital Ramón y Cajal, Madrid, Spain,* [3]*Pharmacoeconomics & Outcomes Research Iberia, Madrid, Spain,* [4]*Hospital Alto Deba, Mondragon, Spain,* [5]*Castilla-La Mancha University, Toledo, Spain,* [6]*Boehringer Ingelheim, Sant Cugat del Vallès (Barcelona), Spain*

OBJECTIVES: Stroke has catastrophic consequences resulting in death or disability in 80% of patients and representing a substantial burden on the health care system, as well as on patients, family, and society. Stroke is considered as the 2nd cause of burden of disease in Europe and ischemic stroke (IS) represents a high percentage of total strokes. The objective of the present study was to analyze the first year post-stroke burden of IS in Spain. **METHODS:** We performed an observational, multicenter, naturalistic and prospective study that included 16 hospitals (stroke units of National Health System hospitals) of 16 Spain regions. We took into consideration consumption of health care resources, social burden, productivity lost and health-related quality of live of patient and caregiver during the first year post-stroke. **RESULTS:** A total of 321 stroke patients were recruited. Mean age 72 years, 54.8% male. Basal NIH stroke scale was 9.11 and 28.9% presented moderate-high disability. 291 (90.7%) patients presented IS. Overall 1-year cost per IS was 27,596.53€. Direct health care costs were 8,623.35€ (31.25%), direct intrahospital health care costs supposed 69% (5,926.21€) of these costs. Direct non-health care costs were 18,377.75€ (66.59%), of which 16,515.09€ (59.84%) were informal care costs. Productivity lost was 595.43€ (2.16%). **CONCLUSIONS:** IS were the majority of total strokes in the study and represent a high burden on health care system and society, mainly due to hospitalization and informal care costs. Intrahospital costs were double than the published DRGs in Spain. Other diseases like Alzheimer or dementia represent a lower burden than stroke.

PCV59

FOLLOW-ON HEALTH CARE COSTS IN PATIENTS WITH ACUTE CORONARY SYNDROME (ACS)

Berger A[1], LaPensee K[2], Oster G[1]
[1]*Policy Analysis Inc. (PAI), Brookline, MA, USA,* [2]*The Medicines Company, Parsippany, NJ, USA*

OBJECTIVES: To review published estimates of post-acute-care costs over one year in patients with acute coronary syndrome (ACS). **METHODS:** Using the Medline and

Embase databases, we identified published reports of direct health care costs in ACS patients in the US; we limited attention to studies published in English between January 1, 2003 and July 30, 2012. Reference lists of all such studies also were scanned to identify additional sources. We abstracted information from all relevant reports on costs of recurrent events (e.g., myocardial infarction [MI], stroke, ACS-related readmissions) and cardiac procedures, as well as costs of cardiac-related outpatient visits and pharmacotherapy and total health care costs, in the year following ACS onset. As appropriate, estimates were converted to 2011 US dollars, using the medical-care component of the US Consumer Price Index. **RESULTS:** A total of 16 studies were identified that met all selection criteria. For persons with private health insurance coverage, estimated cost per recurrent event was lowest for bleeding ($7951) and highest for MI (range = $17,081 - $20,348); the cost of ACS-related admissions ranged from $6818 to $34,089. For Medicare beneficiaries, cost per recurrent event was lowest for other cardiovascular events ($4542 - $14,360) and highest for MI ($10,082 - $11,347); the cost of ACS-related admissions was $13,683. Mean total health care costs for patients with private insurance coverage ranged from $21,319 to $40,062 in the year following ACS onset; similar estimate was identified for Medicare beneficiaries. **CONCLUSIONS:** Costs of follow-on care are high in patients with ACS, due to recurrent events, revascularization, and routine follow-on care. In general, costs were higher for patients with private health insurance coverage than those with Medicare coverage.

PCV60

PATIENT-LEVEL COSTS OF CARDIOVASCULAR EVENTS AND PROCEDURES: HOW ROBUST IS THE EVIDENCE?

Nicholson G[1], Halbert R[1], Nordyke RJ[1], Willis V[1], Siemak B[1], Richhariya A[2], Gandra SR[2]
[1]*ICON, PriceSpective LLC, El Segundo, CA, USA,* [2]*Amgen, Inc., Thousand Oaks, CA, USA*

OBJECTIVES: Few studies have undertaken a global review of major cardiovascular conditions and events. This review summarizes the current literature for costs of: major cardiovascular diseases/events (angina, myocardial infarction, heart failure, stroke/transient ischemic attack, peripheral arterial disease); revascularization (coronary, cerebral, or peripheral); coronary heart disease mortality; and cerebrovascular mortality. **METHODS:** A systematic search of the scientific literature from 2007 through 2012 was conducted. English language articles reporting per-patient average direct medical costs of any cardiovascular event of interest in any country were included. Cost-effectiveness studies and primary prevention interventions were excluded. Cost of the event including initial hospitalization ("acute cost") and any re-hospitalizations or post-event follow-up ("follow-up cost") along with methodologies of each study were abstracted. **RESULTS:** A total of 176 articles representing 30 countries were abstracted. Coronary revascularization (N=46), stroke (N=43), and heart failure (N=31) articles were heavily represented. Acute cost estimates varied widely for all conditions/events (2013 USD): angina ($1,004-8,380); myocardial infarction ($570-$31,321); coronary revascularizations ($240-$129,747); heart failure ($536-$28,176); stroke ($577-$167,378); cerebral revascularizations ($7037-$57,884) peripheral arterial disease ($1241-23,144); peripheral revascularizations ($2297-$129,865); coronary heart disease inpatient mortality ($7,030-$25,556); cerebrovascular disease inpatient mortality ($6,197-$40,141). Similarly, wide variation was found for follow-up cost estimates, based on time horizons that range from 30-day re-hospitalization to the remainder of life post-initial event. The majority of studies were specific to the United States; for countries other than the US, cost estimates for each event were much less robust. Methodological differences between articles limit comparability of costs. **CONCLUSIONS:** Though estimates vary, the significant economic burden of these cardiovascular events is evident. A lack of robust literature in some conditions and countries combined with significant heterogeneity of study design and reporting makes comparison of cardiovascular event costs difficult. New research should identify a representative sample using study designs that allow for comparability.

PCV61

COSTS IN PATIENTS ALONG FIRST YEAR POSTSTROKE IN SPAIN

Álvarez Sabín J[1], Masjuan J[2], Casado MÁ[3], Mar J[4], Oliva J[5], González-Rojas N[6]
[1]*Hospital Vall D'Hebrón, Barcelona, Spain,* [2]*Hospital Ramón y Cajal, Madrid, Spain,* [3]*Pharmacoeconomics & Outcomes Research Iberia, Madrid, Spain,* [4]*Hospital Alto Deba, Mondragon, Spain,* [5]*Castilla-La Mancha University, Toledo, Spain,* [6]*Boehringer Ingelheim, Sant Cugat del Vallès (Barcelona), Spain*

OBJECTIVES: Atrial Fibrilation (AF) 5-folds stroke risk, which results in death or disability in 80% of individuals and the one-year mortality approaches 50%. The objective of the present study was to determine first year post-stroke costs in patients with or without AF. **METHODS:** We performed an observational, multicenter, naturalistic and prospective study that included 16 hospitals (stroke units of National Health System hospitals) of 16 Spain regions. We took into consideration all costs related to stroke: direct health care costs (inpatient and outpatient), societal cots (formal and informal care), and indirect costs (productivity lost) during the first year post-stroke. **RESULTS:** A total of 321 stroke patients were recruited, 291 (90.7%) with ischemic stroke (IS) and 30 (9.34%) with intracraneal hemorraghe (ICH); 160 with and 161 without AF. The mean age was 72±13 years, 54.8% was male, basal NIH stroke scale was 9.11±6.79 and 28.9% presented moderate-high disability. The overall cost per year was 27,711.10€. Direct health care costs: 8,491.22€ (30.64%), intrahospital costs were 68.8% (5,838.41€) of direct health care costs. Direct non-health care costs were 18,643.50€ (67.3% of total costs), and informal care supposed 89.5% of these costs. Indirect costs were 576.39€ (2.1% of total costs). ICH costs were higher than IS costs (28,895.04€ vs 27,596.53€). AF costs were higher than non AF but only formal care costs were statistically significant. The most explicative variables were age, male sex, NIH stroke scale, arterial hypertension comorbidity, and exitus along study. **CONCLUSIONS:** Stroke and its consequences represent an important use of health care and social resources during first year post-stroke, total costs of stroke represent more than 5% of public health care costs in Spain. Several studies from other countries showed similar health care costs but lower informal care costs, which where more than two-thirds of total costs in our study, with a very high burden over the family or informal carer.

PCV62

A COMPARISON OF THE ECONOMIC BURDEN AND HEALTH CARE UTILIZATIONS OF VETERAN PATIENTS DIAGNOSED WITH HYPERTENSION IN THE UNITED STATES

Wang L[1], Xie L[2], Du J[2], Li L[1], Baser O[3]
[1]*STATinMED Research, Dallas, TX, USA,* [2]*STATinMED Research, Ann Arbor, MI, USA,* [3]*STATinMED Research/The University of Michigan, Ann Arbor, Michigan, MI, USA*

OBJECTIVES: To compare the economic burden and health care utilizations of U.S. veteran patients diagnosed with hypertension. **METHODS:** A retrospective database analysis was performed using the Veterans Health Administration Medical SAS datasets from October 1, 2008 to September 30, 2012. Patients diagnosed with hypertension were identified using International Classification of Disease 9th Revision Clinical Modification (ICD-9-CM) diagnosis codes 401.x, 402.xx, 403.xx, and 404.xx, with the first diagnosis date designated as the index date. A comparison group of patients without hypertension but of the same age, region, gender and index year were identified and matched by baseline Charlson Comorbidity Index. The index date for the comparator group was randomly chosen to reduce selection bias. Patients in both groups were required to be at least 18 years old, and have continuous medical and pharmacy benefits 1 year pre- and 1 year post-index date. Study outcomes, including health care costs and utilizations, were compared between the disease and comparator groups using 1:1 propensity score matching. **RESULTS:** A total of 2,422,810 patients were included in the hypertension and comparison cohorts. After 1:1 matching, a total of 748,857 patients were matched from each group, and baseline characteristics were well-balanced. Patients diagnosed with hypertension utilized more health care resources for inpatient (8.21% vs. 1.01%, p<0.01), emergency room (ER) (12.78% vs. 3.60%, p<0.01), physician office (99.43% vs. 39.45%, p<0.01), outpatient visits (99.61% vs. 40.14%, p<0.01), and pharmacy visits (85.51% vs. 35.66%, p<0.01). The disease group also had higher patient expenditures for inpatient ($2,568 vs. $289, p<0.01), ER ($121 vs. $30, p<0.01), physician office ($2,541 vs. $767, p<0.01), outpatient visit ($2,844 vs. $853) and pharmacy visits ($544 vs. $191, p<0.01) than the comparison group. **CONCLUSIONS:** Results suggest that patients diagnosed with hypertension incurred significantly higher health care utilizations and costs compared to those without.

PCV63

THE COSTS OF SURGICAL AORTIC VALVE REPLACEMENT IN FRANCE

Goodall G, Candolfi P
Edwards Lifesciences, Nyon, Switzerland

OBJECTIVES: Surgical aortic valve replacement (sAVR) represents the gold standard for treatment in patients who require valve replacement therapy. However, the risks and costs are not uniform across all patients. We have examined the national hospital costs database of France to detail the variability of outcomes and costs in an attempt to allow improved decision making when deciding on appropriate interventions. **METHODS:** The Programme de Médicalisation des Systèmes d'Information (PMSI) hospital database for 2010 was examined and all discharge records retrieved for patients undergoing aortic valve replacement. In addition to the discharge costs information on hospital length of stay, mortality and Charlson risk score were also obtained. **RESULTS:** The mean cost for all 12,512 recorded sAVR procedures (defined as Groupe homogène de maladies (GHM) codes 05C02 and 05C03) in 2010 was €19,029 (median €17,349). Overall hospital mortality was 5.94% but increased to 26.06% depending on severity level and GHM code. Corresponding total costs increased if patients died prior to discharge by €11,007 and €9,200 for 05C02 and 05C03 respectively but also differed by severity, generally increasing together with mortality up to a maximum mean of €42,063. Hospital length of stay (LoS) also varied by severity levels with means of between 10.74 and 27.91 days dependent on severity. **CONCLUSIONS:** The costs and outcomes of sAVR vary enormously and a single point estimate cannot be used to adequately to reflect them. Therapeutic choices must be tailored to the individual patient and has the potential to generate substantial cost reductions for the payer by avoiding mortality and reducing LoS. We present this in the context of new treatment options for aortic valve replacement.

PCV64

ECONOMIC IMPACT OF STROKE EPISODE IN PATIENTS PREVIOUS DIAGNOSED WITH ATRIAL FIBRILLATION IN PRIVATE HEALTH SYSTEM IN BRAZIL

Araújo G[1], Santos AM[2], Preto MC[3], Bernardino GDR[4], Monteiro RC[4], Fujii RK[5], Donato BMK[6], Barbieri DE[7], Mould J[8], Manfrin DF[5], Fonseca M[9]
[1]*Axia.Bio, Sao Paulo, Brazil,* [2]*Axia.Bio Consulting, São Paulo, Brazil,* [3]*Bristol-Myers Squibb S/A, São Paulo, Brazil,* [4]*Bristol-Myers Squibb, São Paulo, Brazil,* [5]*Pfizer, Inc., São Paulo, Brazil,* [6]*Bristol-Myers Squibb Company, Wallingford, CT, USA,* [7]*Bristol-Myers Squibb – Brazil, São Paulo, Brazil,* [8]*Pfizer, New York, NY, USA,* [9]*Federal University of São Paulo / Axia.Bio Consulting, São Paulo, Brazil*

OBJECTIVES: Evaluate the costs of patients with known diagnosis of atrial fibrillation who received medical care related to stroke episodes, under the Private Healthcare system perspective. **METHODS:** A retrospective evaluation of a database with 3 million individuals was conducted to identify patients diagnosed with Atrial Fibrillation (AF) using the International Classification of Diseases version 10 (ICD10) I48 code (Flutter and atrial fibrillation) between 2009 and 2010. From the identified cohort, patients presenting the following codes: ICD10 I64, I63, I66 and I69, were further analyzed from 2009 to 2012. Costs associated to the episodes such as medications, exams, procedures, hospitalizations and others were evaluated. **RESULTS:** From 1898 patients presenting the AF diagnose identified in the database, 66 Presented a diagnosis of stroke. The 66 patients cost BRL 2,325,250.61 to the supplemental health service, being BRL 2,193,185.50 spent with 21 patients hospitalizations due to stroke. **CONCLUSIONS:** If not controlled, AF may impose a significant morbidity due to increased susceptibility for thromboembolic events such as stroke and its complications, causing important spending beyond hospitalizations and other significant direct and indirect costs to the private health care system.